What is claimed is:

~~1. An isolated DNA sequence comprising a DNA sequence selected from~~ the group consisting of:

(a) nucleotides #256, 307, 310, 313, 316, 319, 322, 325 or 328 to #1140 or 1143 of SEQ ID NO: 1; and

(b) sequences which hybridize to (a) under stringent hybridization conditions and encode a protein which exhibits *Frazzled* activity.

2. An isolated DNA sequence comprising a DNA sequence selected from the group consisting of:

(a) nucleotides encoding amino acids #1, 18, 19, 20, 21, 22, 23, 24 or 25 to #295 of SEQ ID NO: 2;

(b) nucleotides encoding amino acids #1 to #275 of SEQ ID NO:3; and

(c) sequences which hybridize to (a) or (b) under stringent hybridization conditions and encode a protein which exhibits ~~*Frazzled*~~ activity.

3. A vector comprising a DNA molecule of claim 1 in operative association with an expression control sequence therefor.

4. A vector comprising a DNA molecule of claim 2 in operative association with an expression control sequence therefor.

5. A host cell transformed with the vector of claim 3.

6. A host cell transformed with the vector of claim 4.

~~7. An isolated DNA molecule comprising a DNA sequence selected from~~ the group consisting of:

(a) nucleotide ~~#316~~ to #1143 of SEQ ID NO: 1; and

(b) ~~naturally occurring allelic sequences and equivalent degenerative codon sequences of (a).~~

8. A vector comprising a DNA molecule of claim 7 in operative association with an expression control sequence therefor.

9. A host cell transformed with the vector of claim 8.

10. An isolated DNA molecule encoding human SDF-5 protein, said DNA molecule comprising nucleotide #316 to #1143 of SEQ ID NO: 1.

11. An isolated DNA molecule according to claim 10, further comprising a nucleotide sequence encoding a suitable signal peptide 5' to and linked in frame to the DNA coding sequence.

12. A vector comprising a DNA molecule of claim 11 in operative association with an expression control sequence therefor.

13. A host cell transformed with the vector of claim 12.

14. An isolated DNA molecule encoding human SDF-5 protein, said DNA molecule comprising nucleotide #256 to #1143 of SEQ ID NO: 1.

15. A method for producing purified human SDF-5 protein, said method comprising the steps of:

(a) culturing a host cell transformed with a DNA sequence according to claim 1, comprising a nucleotide sequence encoding human SDF-5 protein; and

(b) recovering and purifying said human SDF-5 protein from the culture medium.

16. A method for producing purified human SDF-5 protein said method comprising the steps of:

(a) culturing a host cell transformed with a DNA sequence according to claim 2, comprising a nucleotide sequence encoding human SDF-5 protein; and

(b) recovering and purifying said human SDF-5 protein from the culture medium.

17. A method for producing purified human SDF-5 protein said method comprising the steps of:

(a) culturing a host cell transformed with a DNA sequence according to claim 7, comprising a nucleotide sequence encoding human SDF-5 protein; and

(b) recovering and purifying said human SDF-5 protein from the culture medium.

18. A purified human SDF-5 polypeptide comprising an amino acid sequence according to SEQ ID NO: 2 or SEQ ID NO: 3.

19. A purified human SDF-5 protein produced by the steps of

(a) culturing a cell transformed with a DNA comprising the nucleotide sequence from nucleotide #316 to #1143 as shown in SEQ ID NO:1; and

(b) recovering and purifying from said culture medium a protein comprising the amino acid sequence from amino acid #21 to amino acid #295 as shown in SEQ ID NO:2.

20. A composition comprising a therapeutic amount of at least one human SDF-5 polypeptide according to claim 19.

21. A method for altering the regulation of pancreatic genes in a patient in need of same comprising administering to said patient an effective amount of the composition of claim 20.

22. A purified human SDF-5 protein comprising the amino acid sequence from amino acid #1 to #295 of SEQ ID NO:2.

23. A purified human SDF-5 protein comprising the amino acid sequence from amino acid #1 to #275 of SEQ ID NO:3.

24. Antibodies to a purified human SDF-5 protein according to claim 22.

25. A purified human SDF-5 protein having a molecular weight of about 30 to about 35 kd, said protein comprising the amino acid sequence of SEQ ID NO:3 and having the ability to regulate the transcription of one or more genes.

26. Antibodies to a purified human SDF-5 protein according to claim 25.

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ABSTRACT

Purified human SDF-5 proteins and processes for producing them are disclosed. DNA molecules encoding the human SDF-5 proteins are also disclosed. The proteins may be used in regulating the binding of *Wnt* genes to their receptor. In preferred embodiments, the proteins may be used for inducing formation, growth, differentiation, proliferation and/or maintenance of chondrocytes and/or cartilage tissue, and for other tissue repair, such as pancreatic tissue repair.

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